

## REMARKS

Applicants respectfully provisionally elect, with traverse, the first species containing Claims 1, 2, 4 and 5, for prosecution on the merits.

The first species, Claims 1-2 and 4-5, recites a beam-forming apparatus and method in which a GPS receiver-equipped mobile station transmits GPS position information to a base station, and the base station forms a transmission/reception beam based on the GPS position information in a mobile communication system using an antenna array. The second species, Claims 7-13, recites a beam-forming apparatus and method in which a base station calculates the relative coordinates of a mobile station from GPS position information received from the mobile station, derives position and angle information of the mobile station from the coordinates, calculates a weight vector based on the position and angle information, and forms a transmission/reception beam with the weight vector in the direction of the mobile terminal in a mobile communication system using an antenna array.

The present invention solves the problems raised in the conventional prior art as follows. By taking into consideration the characteristic of a time-spatial channel varying with time, the appropriate function between a weight vector for a reception antenna array and a weight vector for the transmission antenna array is difficult to define in the conventional art. Some mobile stations equipped with GPS receivers in the mobile communication system receive their position information from GPS satellites. However, the mobile stations provide the position information to users only, not to a base station. The foregoing problems can be addressed by the features set forth in the first species. But, since the second species includes calculating relative coordinates, which is used in calculating the weight vector to form a transmission/reception beam in the direction of the mobile terminal, the first and second species both relate to generating a weight vector.

Based on at least the foregoing arguments, withdrawal of the election requirement is respectfully requested.

Should the Examiner have any questions, he is requested to contact the undersigned at the number indicated below. Early and favorable consideration of the claims is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul J. Farrell", written over a horizontal line.

Paul J. Farrell  
Registration No. 33,494  
Attorney for Applicants

DILWORTH & BARRESE, LLP  
333 Earle Ovington Blvd.  
Uniondale, New York 11553  
(516) 228-8484

PJF/MJM/dr